IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (canceled)

2. (previously presented) The method of claim 10 wherein the modulator is a phase modulator driven by a sinusoidal RF voltage.

3. (previously presented) The method of claim 10 wherein the modulator is a phase modulator driven by a train of square pulses.

4. (previously presented) The method of claim 10 wherein the optical signal is launched into the modulator having a polarization oriented at a predetermined angle such that the polarization of successive optical bits of the output signal are substantially orthogonal.

5. (previously presented) The method of claim 10 wherein the modulator is a Mach-Zehnder modulator including a polarization rotation device in at least one arm.

6. (original) The method of claim 5 wherein the polarization rotation device is a half-wave plate.

7. (original) The method of claim 5 wherein at least one arm of the modulator is driven by a sinusoidal RF voltage.

8. (original) The method of claim 5 wherein at least one arm of the modulator is driven by a train of square pulses running at half the bit rate.

9. (Currently amended) A method of APol-PSK transmission comprising:

using an electronic data signal to drive a Mach-Zehnder modulator having a polarization rotation device in at least one arm to provide simultaneous polarization alternation and optical data encoding by phase shift keying between two optical bits separated by an even number of bit periods to generate an APol-PSK signal; wherein input signals to both arms of the Mach-Zehnder modulator have polarizations that are the same.

10. (previously presented) A method comprising:

precoding an electronic data signal;

modulating the output of an optical source using the precoded electronic data signal and differential phase shift keying between two optical bits separated by an even number of bit periods to generate an encoded optical signal;

alternating the polarization of the encoded optical signal using a modulator such that successive optical bits have substantially orthogonal polarizations to generate an APol-DPSK signal; and

demodulating the APol-DPSK signal using an even bit delay line interferometer.

11. (canceled)

12. (previously presented) A method of APol-DPSK transmission comprising:

precoding an electronic data signal;

using the precoded electronic data signal to drive a Mach-Zehnder modulator including a polarization rotation device in at least one arm to provide simultaneous polarization alternation and optical data encoding by phase shift keying between two optical bits separated by an even number of bit periods to generate an APol-DPSK signal;

wherein input signals to both arms of the Mach-Zehnder modulator have polarizations that are the same.

13. (original) The method of claim 12 wherein the polarization rotation device is a half-wave plate.

14. (original) The method of claim 12 further comprising demodulating the APol-DPSK signal using an even bit delay line interferometer.

15. (canceled)

16. (canceled)

17. (canceled)

18. (canceled)

19. (previously presented) The transmitter of claim 25 wherein at least one arm of the modulator is driven by a sinusoidal RF voltage.

20. (previously presented) The transmitter of claim 25 wherein at least one arm of the modulator is driven by a train of square pulses running at half the bit rate.

21. (previously presented) The transmitter of claim 25 wherein the Mach-Zehnder modulator comprises two complementary output ports, and wherein the transmitter further comprises a polarization beam combiner for combining outputs from the two output ports of the Mach-Zehnder modulator.

22. (previously presented) The transmitter of claim 21 wherein at least one arm of the modulator is driven by a sinusoidal RF voltage.

23. (previously presented) The transmitter of claim 21 wherein at least one arm of the modulator is driven by a train of square pulses running at half the bit rate.

24. (canceled)

25. (currently amended) An optical transmitter for APol-PSK transmission comprising:

an optical source;

a Mach-Zehnder (MZ) modulator device optically coupled to the laser source having a polarization rotation device in one arm; and

drive circuitry coupled to the MZ modulator device to drive a MZ modulator to simultaneously provide polarization alternation and optical data encoding of an optical signal using phase shift keying between two optical bits separated by an even number of bit periods;

wherein input signals to both arms of the Mach-Zehnder modulator have polarizations that are the same.

26. (previously presented) An optical transmitter for APol-DPSK transmission comprising:

an optical source;

a precoder;

a Mach-Zehnder (MZ) modulator device optically coupled to the laser source having a half-wave plate in one arm; wherein input signals to both arms of the Mach-Zehnder modulator have polarizations that are the same; and

drive circuitry coupled to the MZ modulator device to drive a MZ modulator using a precoded data signal from the precoder to simultaneously provide polarization alternation and optical data encoding of an optical signal using phase shift keying between two optical bits separated by an even number of bit periods.

27. (canceled)

28. (currently amended) An optical transmission system for APol-PSK transmission comprising:

an optical source,

a modulator means having a polarization rotation device to provide simultaneous polarization alternation and optical data encoding by phase shift keying between two optical bits separated by an even number of bit periods to generate an APol-PSK signal.

29. (previously presented) An optical transmission system for APol-DPSK transmission comprising:

an optical source;

a precoder device for precoding an electronic data signal;

an optical phase-shift-keying data modulator optically coupled to the laser source and driven by a precoded electronic data signal from the precoder device to produce an optical DPSK signal wherein electronic data to be transmitted is optically encoded by the data modulator as differential phase shift keying between two optical bits separated by an even number of bit periods;

a polarization alternator optically coupled to the data modulator to provide polarization alternation of the output of the data modulator; and

a demodulator comprising an even bit delay line interferometer.

30. (canceled)

31. (newly added) A method, comprising:

encoding data by differential phase shift keying between non-adjacent bits.

32. (newly added) The method of claim 31, wherein the non-adjacent bits are separated by an even number of bit periods.